

AMENDMENTS TO THE CLAIMS

Claims 1-22 (Canceled)

23. (Currently Amended) A speech decoding method according to code-excited linear prediction (CELP) wherein the speech decoding method receives a coded speech code including a linear prediction parameter code and an adaptive code, and a gain code, and synthesizes a speech using at least an excitation codebook, the speech decoding method comprising:

obtaining an adaptive code vector from an adaptive codebook based on the received adaptive code;

obtaining a time series vector with a noise level from the excitation codebook based on the excitation code;

decoding a gain of the adaptive code vector and a gain of the time series vector from the gain code;

obtaining a time series vector with a noise level from the excitation codebook;

determining whether modification of the time series vector is necessary;

if modification of the time series vector is determined to be necessary, modifying the time series vector such that the noise level density of zero-amplitude samples is changed as a function of whether the coded speech is voiced or unvoiced;

weighting the adaptive codebook vector and the time series vector using the decoded gains as weights;

adding together the weighted adaptive codebook vector and the weighted time series vector;

decoding a linear prediction parameter from the received linear prediction parameter code; and

~~outputting the time series vector; and~~

synthesizing a speech using the outputted time series vector linear prediction parameter and the addition result.

24. (Currently Amended) A speech decoding apparatus according to code-excited linear prediction (CELP) wherein the speech decoding apparatus receives a coded speech code including a linear prediction parameter code, an excitation code, an adaptive code, and a gain code, and synthesizes a speech using at least an excitation codebook, the speech decoding apparatus comprising:

a time series vector modulator for:

obtaining an adaptive code vector from an adaptive codebook based on the received adaptive code,

obtaining a time series vector with a noise level from the excitation codebook based on the excitation code,

decoding a gain of the adaptive code vector and a gain of the time series vector from the gain code, and

determining whether modification of the time series vector is necessary and for modifying the time series vector such that the noise level density of zero-amplitude samples is

changed as a function of whether the coded speech is voiced or unvoiced if modification of the time series vector is determined to be necessary, and for outputting the times series vector; and a speech synthesizer for:

weighting the adaptive codebook vector and the time series vector using the decoded gains as weights,

adding together the weighted adaptive codebook vector and the weighted time series vector,

decoding a linear prediction parameter from the received linear prediction parameter code, and

synthesizing a speech using the addition result.